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SWEET CLOVER

SWEET CLOVER FEEDS STOCK AND SOIL

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Sweet Clover for Ohio

A veritable crop revolution is quietly occurring in Ohio and other states of the corn belt. Ten years ago one would have travelled far to find a total of 1000 acres of sweet clover sown as a crop in Ohio. Today a single county has 30,000 acres of sweet clover, and the entire state over 100,000 acres. It is already the second legume in the state in acreage, being exceeded only by red clover. Yet this is only the beginning. Sweet clover is destined to become one of the standard farm crops of the state, furnishing rich hay and pasture and making possible the production of larger and larger yields of grain.

Kinds of Sweet Clover

There are four kinds of sweet clover of which seed is obtainable in the seed trade. They are the biennial white, the biennial yellow, the annual white or Hubam, and the annual yellow. The annual yellow has no place in Ohio. When sown in the spring it makes a growth of from 10 to 15 inches, forms seed, and dies by midsummer. The seed is very cheap and has been sold as a substitute for other sweet clovers, tho the seeds are easily distinguished.

Hubam Clover.—Much has been heard in the past 3 years concerning annual white sweet clover, or Hubam clover. This has two qualities to recommend it: (1) It will usually produce more hay in the summer and fall after small grain than any other crop that can be sown in small grain. (2) If Hubam is plowed under in the fall of the year it is sown, it does not sprout from the roots and so become a weed the next year. However, the hay is inferior in quality to that produced by the biennial sweet clovers the same year they are seeded, and its root system is so small (Fig. 1) that its soil-improving value is very slight unless the entire crop is plowed under. Even then it is inferior to the biennial sweet clovers. All things considered, there is little to suggest an extensive use of Hubam in Ohio, tho it is a valuable crop in some circumstances.

White or Yellow Biennial?—Of the two biennials the white is more widely grown, and is the best for general Ohio conditions. When sown in the spring, the white will make decidedly more hay the first fall than the yellow, but the yellow usually produces a greater weight of roots, so the total organic matter produced is not greatly different. The second year the yellow has much finer stems than the white, matures from 10 days to 2 weeks earlier,

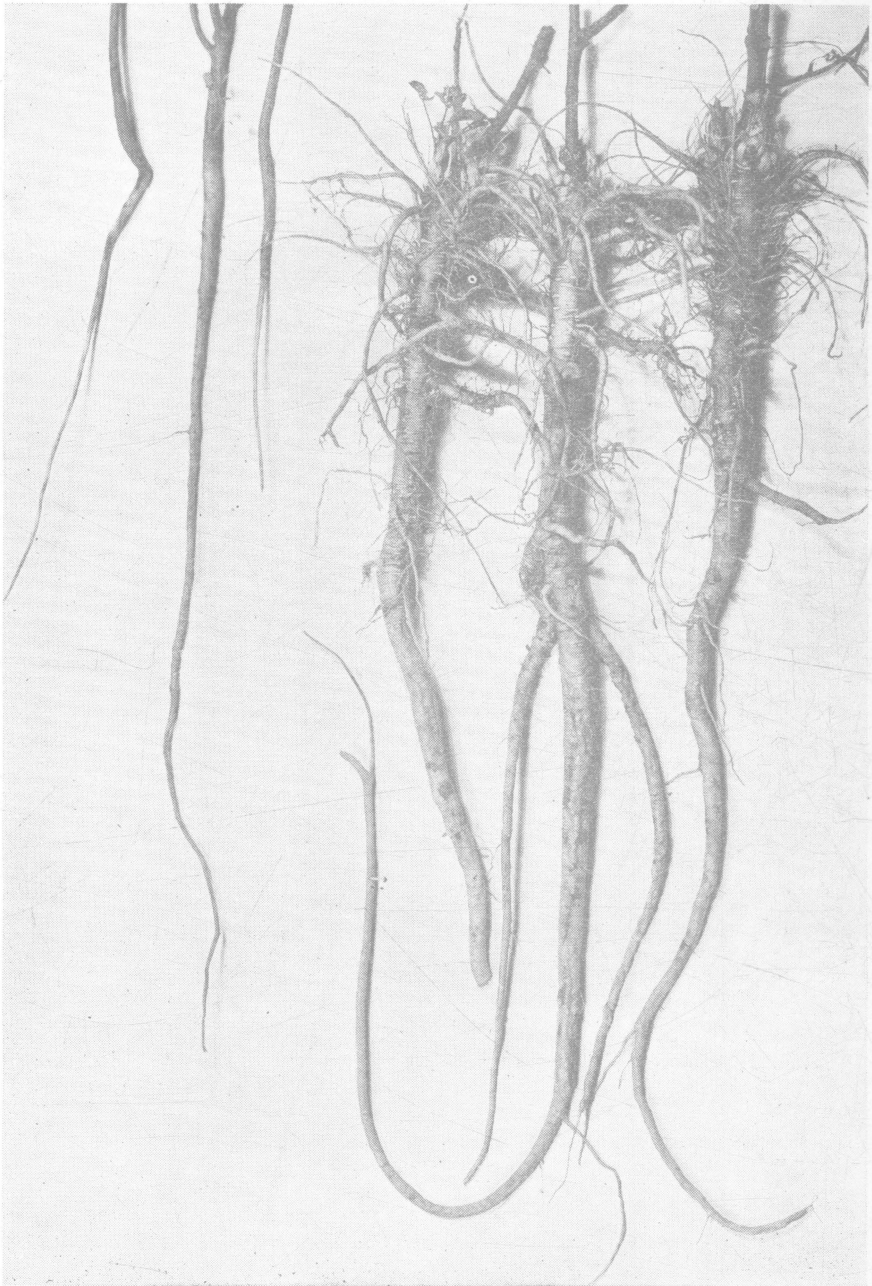

FIG. 1. ROOTS OF HUBAM AND WHITE BIENNIAL SWEET CLOVERS.
Left, Hubam; Right, Biennial. Plants grown within two feet of each other, both sown April 21 in wheat, photo. October 2. Center Hubam root is 14″ long.

and yields less. The white seems to have a somewhat deeper root system than the yellow. For purposes of soil improvement, hay the first year, and pasture, sow the white; for hay the second year the yellow may be better because of its finer stems. Likewise, the seed crop of the yellow is easier to harvest.

There are a number of strains of biennial white, some of which differ as widely as do red and mammoth clovers (Fig. 2). Much more experimentation by farmers and experiment stations is needed before the better strains of the biennial sweet clovers are developed and made known, but meanwhile one cannot go wrong

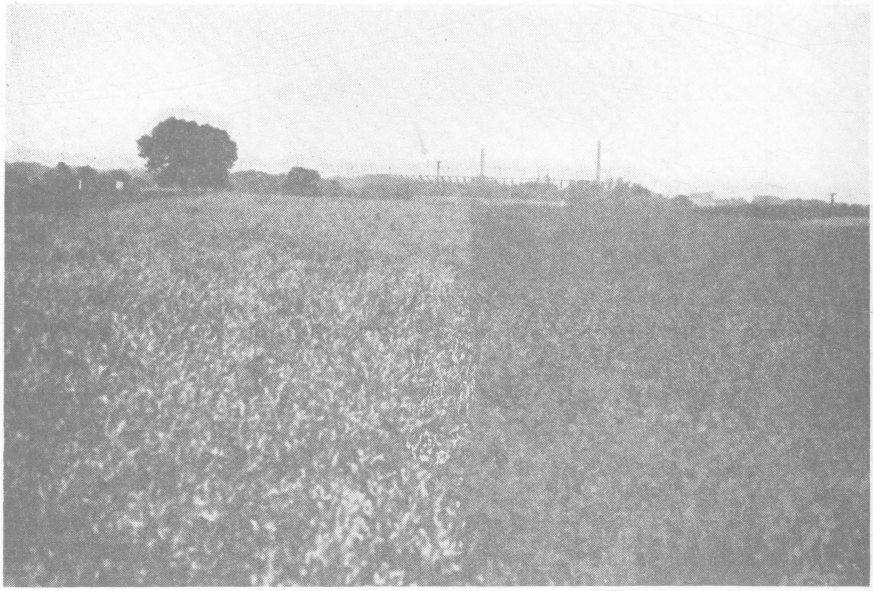

FIG. 2. STRAINS OF WHITE SWEET CLOVER, JUNE 6.
Left, early maturing strain in full bloom. Right, ordinary strain, buds just appearing.

in using one of them. Since the ordinary strain of biennial white sweet clover is responsible for most of the remarkable interest in the crop, it is the only one which will be considered hereafter, tho the discussion applies to any of the biennial sorts.

Why Sweet Clover is Valuable

Sweet Clover Grows Anywhere—If Lime is Present.—Sweet clover may be found growing along roadsides, in beach sand, on railroad embankments, along streams, and in washed and gullied fields. This wide distribution in waste places gave the plant its former reputation as a weed. When one attempts to domesticate

it, however, he finds one important limitation—the soil must be sweet. While sweet clover will grow sometimes in slightly acid soils, in practice a neutral or basic soil is required for a profitable crop. Even alfalfa is not more particular in this respect. Given this, however, it is tolerant of most other soil conditions. Sweet clover will grow in water-logged soils nearly as well as alsike, and far better than red clover or alfalfa. However, it may winterkill by heaving on such soils, since it is more subject to heaving than either red or alsike clovers. On the other hand, sweet clover is extremely drouth resistant, more so than alfalfa, and as a consequence it furnishes pasturage during summer dry periods when other pasture plants fail.

Sweet Clover Makes Enormous Yields. — Under favorable conditions alfalfa is its only competitor. Not only does it usually make more top growth than red or alsike clover, but it makes more root growth than any other biennial legume. In April, 1923, for example, plots of sweet clover yielded more than twice as many pounds of roots per acre as adjacent red clover plots. This root system is remarkably deep, and the roots are of large size to considerable depths. In July of the second year,

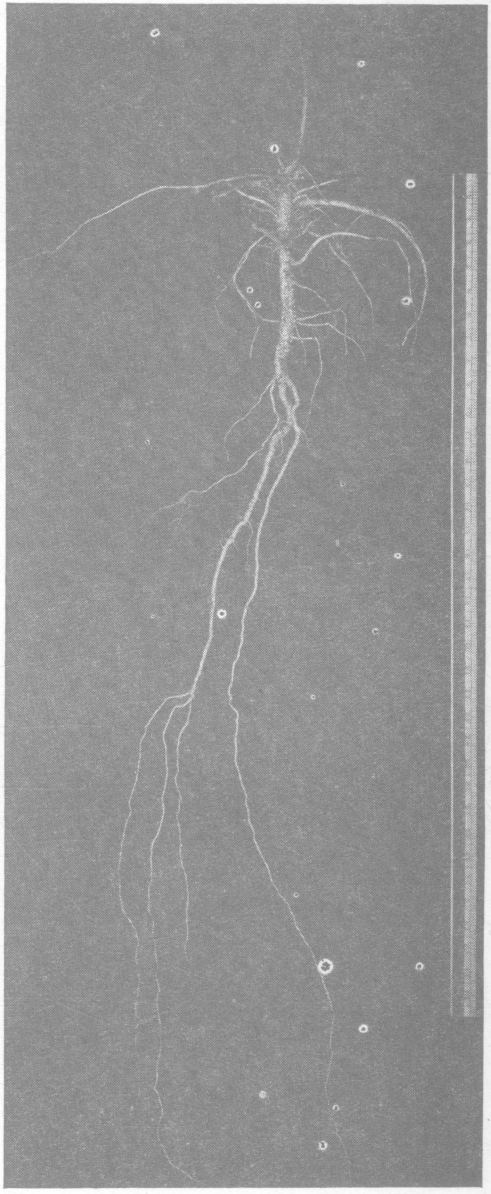

FIG. 3. THE MOST EFFICIENT SUBSOILER.
Root of white sweet clover, sown April 20 in oats, dug in November same year.

roots were found to a depth of 5½ feet in ordinary upland soil on the Ohio State University farm. Even in the fall of the year the sweet clover is seeded, the roots may be 4 feet deep (Fig. 3).

Other Valuable Features.—Sweet clover is markedly disease resistant. Root rot, anthracnose, and similar diseases which have reduced the yield and acreage of red clover in recent years do not affect it. Sweet clover has the same nitrogen fixing bacteria as alfalfa, and so prepares the way for alfalfa by thoroly inoculating the soil and by improving the drainage as well.

Sweet Clover for Soil Improvement

The Equal of 20 Tons of Farm Manure.—The most important single use for sweet clover is as a soil-improving crop. Many farmers grow it for this purpose only, and all who grow it have its value for this in mind. On soils containing lime or to which lime can be added, sweet clover is so much the best soil builder as to stand alone. If left for 2 years it may yield from 3 to 6 tons dry weight per acre of organic matter containing 150 to 250 pounds of nitrogen—as much of both as is contained in 15 to 25 tons of ordinary farm manure. How many farmers apply 20 tons of manure to each acre every 4 years as can be done by sweet clover in a 4-year rotation of corn, oats, wheat, and sweet clover?

Feeding Sweet Clover to Corn.—However, it is not necessary to leave it for 2 years to secure wonderful soil building results. Plowed under in late April or early May, 1 year after sowing, it will return to the soil from 75 to 150 or more pounds of nitrogen per acre. The latter amount is enough for the grain and stover of 100 bushels of corn. Compare this with the 4 pounds of nitrogen added to the soil by 200 pounds of 2-12-2 fertilizer! Why buy commercial nitrogen when sweet clover will take it from the air and pay you for doing it? The nitrogen in sweet clover plowed under in this way is available as rapidly as the succeeding crop can use it, since green, succulent sweet clover decomposes in from 21 to 28 days.

Sweet clover also has unusual power to make use of the less available plant foods of the soil, especially phosphorus compounds. These materials are gathered from the deep layers of the soil by the sweet clover roots, and then become available to the next crop when the clover is plowed down.

Renews Tilth and Drainage.—The soil is also greatly improved physically. The land plows more easily after a crop of sweet clover has decayed because of the loosening effect of the organic matter

returned. The drainage is tremendously improved. As these large roots decay, open channels for water are left thru the hard subsoil, while the structure of the subsoil is improved by the residues added to it. Many farmers have found after growing sweet clover that drain tile which had gradually failed to carry off all the water between the tile because of the increasing compactness of the soil under continued cultivation, now keep all the land free of water.

Rotations for Soil Building.—The most popular and practical way to use sweet clover as a soil builder is as a catch crop in a 2-year rotation of corn-oats or corn-wheat, in which sweet clover is sown in the small grain and plowed down the following spring for corn. This combination can be worked into many practical rotations to serve different purposes. The following 4-year rotations will illustrate:

(a) Corn, oats (sweet clover), corn, wheat (sweet clover).
(b) Corn, oats, red clover, wheat (sweet clover).
(c) Corn, corn, soybeans, wheat (sweet clover).
(d) Corn, oats (sweet clover), potatoes, wheat (sweet clover).

Many modifications and combinations of these rotations can be worked out. Canning crops particularly have benefited by the sweet clover catch crop.

Plow Under in Spring After Growth is Well Started.—In these rotations the sweet clover must not be plowed down until from 8 to 20 inches of growth has been made in the spring of the second year. (Lower illustration on page 1 shows a field in ideal condition for plowing under. The sweet clover was seeded in wheat the spring previous.) If biennial sweet clover is plowed the fall after seeding or very early in the spring, the big fleshy roots are not killed, and stalks come up in the succeeding crop almost as if the land had not been plowed. This is the only way in which sweet clover is ever a weed in cultivated land, but nearly every farmer who has raised sweet clover has learned by experience how troublesome it can be in this way. However, after growth is once well started in the spring, plowing entirely kills sweet clover.

There is little advantage in waiting for more growth after the sweet clover is large enough so that it will be killed. A considerable part of the top growth is offset by a loss in the amount of roots, while if plowing is delayed too long a dry spell may make it hard to prepare a seedbed for the crop following. In a wet season, sweet clover may be plowed sooner than bare ground because of this drying effect. The roots of sweet clover make it harder to plow at this time than bare land, but it is by no means as hard to plow as alfalfa.

Sweet Clover for Pasture

Sweet clover is rapidly becoming one of the leading pasture plants of the corn belt. The old belief that "stock won't eat it" has been exploded too often to have weight at this time. When stock that are not used to it are turned into a pasture containing sweet clover and plenty of other feed they do not eat the sweet clover, but if turned into sweet clover alone when in proper condition or into a mixed pasture early, no trouble will be experienced.

Many Virtues as Pasture.—Its carrying capacity is amazing. The difficulty is usually to keep stock enough on it to keep it from getting too coarse. Farmers have estimated the carrying capacity

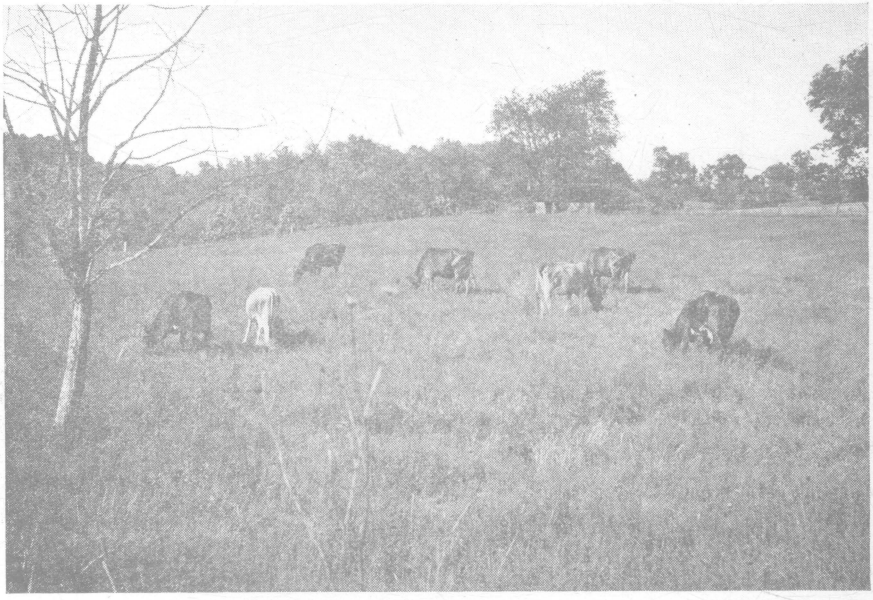

FIG. 4. CONTENTMENT IN SWEET CLOVER.

of sweet clover to be from one to four mature animals per acre. In general, it will carry double the stock that bluegrass or mixed grass pasture will on the same land. Stock of all kinds thrive on it (Fig. 4).

Sweet clover is very high in mineral content, especially of calcium, and so is particularly valuable for dairy cattle and young stock. It never fails to cause an increased milk flow. Opinions differ as to its effect on the flavor of the milk, but many dairymen use it with no complaints. It starts very early in the spring, so that it can be pastured from one to two weeks sooner than other pastures. Bloating is almost unknown on sweet clover pasture.

There have been a few cases in wet weather, but there is very much less danger than in pasturing any other legume.

Sweet clover is a valuable hog pasture. The first year's growth, especially, is nearly or quite the equal of alfalfa. The second year's growth becomes coarse too rapidly for best results as hog pasture.

Sweet Clover Well Grazed is Best.—Some care is needed to get the greatest use out of the pasture. Stock should be turned on sweet clover early and the pasture should be stocked so that it does not get ahead of the stock, yet not so heavily as to kill it. If it is not kept eaten it will get coarse, bloom, form seed and die

FIG. 5. SWEET CLOVER IN A HOCKING COUNTY PASTURE.
A broom sedge pasture treated three years before with two tons limestone, 800 pounds acid phosphate, and a grass mixture including sweet clover.

in early August, while by keeping it pastured off it may be made to furnish succulent pasture for a much longer period.

Sweet Clover in Permanent Pastures.—Since it is only a biennial, sweet clover must be allowed to form seed if it is used in permanent pastures. If not too heavily pastured, seed will form on the lower branches, but seed production may be insured by dividing the pasture in two and allowing the sweet clover to go to seed on half the pasture each year. Sowing sweet clover seed in the early spring with a disc drill or broadcast on honeycombed ground is also a valuable practice in permanent pastures. Sweet

clover used in this way has had a remarkable rejuvenating effect on some of the hill pastures in southeastern Ohio (Fig. 5). However, limestone is absolutely necessary on most of these hill pastures.

Sweet Clover in Rotation Pastures.—The way to secure the most pasture from sweet clover is to pasture it in a regular rotation, for example: Corn, oats, wheat, sweet clover. The second year's growth is then pastured from early spring until it dies out in August or early September. By that time the sweet clover in the wheat stubble is ready to be pastured for the rest of the season. In this way an all-season supply of feed may be secured.

FIG. 6. ALL READY FOR SPRING.
Crowns of Sweet Clover sown April 20 in oats, dug early in November. Note the numerous large crown buds, the many nodules on the smaller roots, and the abundant surface branching.

Sweet Clover Hay

First Year Hay the Equal of Alfalfa.—Hay may be cut from sweet clover either the year after it is sown, as with red and alsike clover, or in the fall of the year it is sown. The best hay from sweet clover is secured the year it is sown. This hay is fine, leafy, easily cured, and the equal of any alfalfa in composition, palatability and feeding value. It should ordinarily be cut in September, and its removal does not seem to injure the stand.

In the late summer, sweet clover forms numerous large buds at the crown (Fig. 6), which will produce the next year's crop.

After these buds are well formed the sweet clover is ready for winter, and the taking off of the season's growth does not injure it. This crop need not be cut higher than other hay crops are cut. On good soils, the yields will average from 1 to 2 tons, with exceptional yields higher (Fig. 7). Taking off this crop of hay does not materially reduce the soil improving value of the crop the next spring, since this growth largely weathers away by spring if left on the ground.

The 2-year rotation—corn, oats (sweet clover), or corn, wheat (sweet clover)—is thus one of the most intensive possible, since it gives two grain crops, a hay crop, and a green manure crop

FIG. 7. A HENRY COUNTY STUBBLE-FIELD IN SEPTEMBER.
How does this compare with ragweed?

large enough to maintain and increase the grain yields, all in two years.

Second Year's Crop Ill-Suited for Hay.—The second year's growth is hard to use as hay. Sweet clover rapidly becomes coarse and stemmy as it comes into bloom, so, to secure good hay it must be cut before the blossoms appear. This is in late May or early June, which is not usually good haying weather. The leaves shatter very easily. The succulent stems may contain as much as 85 per-cent of water, and so are slow to dry. All things considered, one cannot recommend depending on the second year's growth of sweet clover hay. However, it is good hay whenever it is possible to get

it well cured—equal to alfalfa in every way except that it is coarser. There is no difficulty in getting stock to eat the hay.

Cut High the Second Year.—Furthermore, the plants must be cut high the second year or they will be killed. After the crown buds have started in the spring of the second year, sweet clover never sends out new shoots from the crown as do alfalfa and red clover. The second crop must come from living buds on the stems. No definite height of cutting can be given, but it must be high enough to leave two or three green leaves and branches on the stubble. This will be from 6 to 20 inches high, depending on when the clover is cut and the thickness of the stand (Fig. 8). In a thin stand the plants can be cut lower without being killed than in a thick stand. After the plants are in bloom it is hardly possible to cut them and have a satisfactory second crop. For this reason it is rarely practical under Ohio conditions to get two hay crops or a hay crop and a seed crop the second year.

FIG. 8. PLANTS FROM THICK AND THIN STANDS, JUNE 13.
Left, a plant from a thin stand, which would make a second crop if cut 6" high: Right, one from a dense stand, which would be killed if cut less than 18" high.

In order to cut the sweet clover high, some use special shoes of strap iron or 2- by 8-inch lumber under each end of the cutter bar on the mowing machine. Others use the grain binder, setting the bundles in shocks of two or four to cure. Sometimes good hay is produced in this way, but it may mold before it is cured.

Requirements for Growing Sweet Clover

Because sweet clover is a common roadside plant, many make the mistake of supposing that it is of the easiest culture. There have been many failures to secure a stand of sweet clover, and there will be unless certain requirements are met. The most important of these are a sweet soil, inoculation, and seed of high germination.

Lime for Sweet Clover.—Before seeding sweet clover the soil should be tested, and, if acid, its lime requirement should be met by applying lime in some form. Usually in western Ohio 1 to 2

FIG. 9. LIMING MADE THE DIFFERENCE.

Miami County. Left, no lime. Right, 2 tons ground limestone. Sweet clover sown over entire field.

tons of ground limestone will be sufficient. It cannot be too strongly emphasized that on hundreds of thousands of acres this is the factor which will mark the difference between success and failure (Fig. 9).

Inoculation.—As with most new legumes, failure to inoculate the soil or seed accounts for many sweet clover failures. Any soil which requires inoculation for alfalfa requires it for sweet

clover, since they have the same strain of bacteria. It is not safe to assume that a field is inoculated because sweet clover is growing along the road beside it. It may be, but since failure will result if it is not, and artificial inoculation is simple and cheap, inoculation should always be practiced when seeding sweet clover for the first time on a field. Soil from an established alfalfa field or roadside sweet clover patch is as effective as the commercial cultures.

Seed of High Germination, Scarified, Should be Used.—A very large share of sweet clover seed as usually harvested will not germinate at once when sown. This is due to the presence of from 25 to

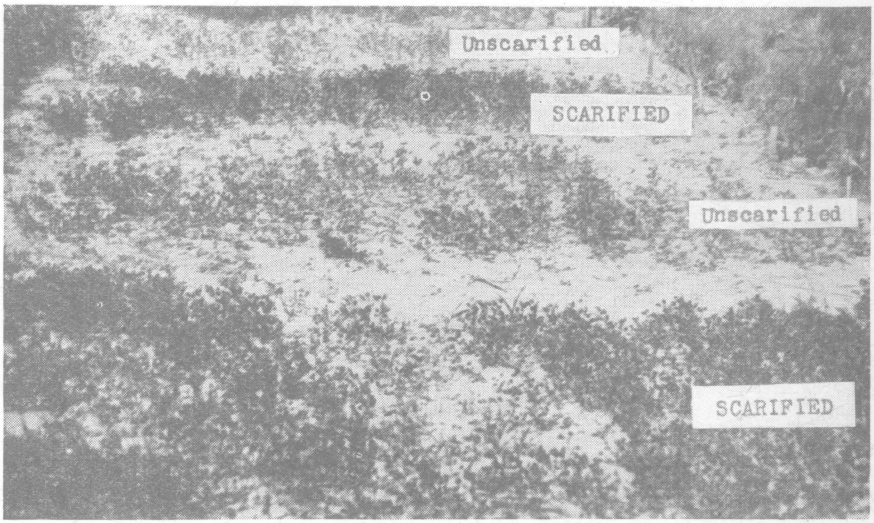

FIG. 10. IT PAYS TO SCARIFY.

Plot in foreground, scarified; next back, unscarified; and so on. Sown April 20 at 10 pounds per acre. Picture taken June 7. All Ohio grown seed. Actual stands, scarified 26 plants per square foot, unscarified 15 plants per square foot.

90 percent of "hard" seeds. These are seeds which have a waterproof seed coat, and when planted in moist earth they do not take up water and sprout for some months or years until the seed coat has decayed or been broken by freezing. A process, known as scarification, has been devised to break this seed coat. It consists of blowing the seed over coarse sandpaper at a very high rate of speed, thereby scratching the seed coat enough to allow water to enter. By this treatment from 80 to 95 percent of sweet clover seed may be made to germinate. Scarified seed or at least seed of good germination, should always be insisted upon (Fig. 10).

Seeding Practices

The usual rate of seeding is from 10 to 12 pounds of scarified seed per acre. If it is being grown for seed, considerably less seed may be used. When sown in wheat, sweet clover may be sown in any way that red clover is. Perhaps the best method is to drill the seed crosswise of the wheat as early as the ground can be worked. If one is using unscarified seed, or unhulled seed from the threshing machine, it is best to sow it before the end of freezing weather, since freezing will cause many of the "hard" seeds to germinate. Some even sow such seed in November or December, but there is nothing to recommend this for Ohio conditions.

When sown with oats it is usually sown from the grass seed attachment on the drill as the oats are sown. The sweet clover frequently grows tall enough so that it is cut with the oats and makes the bundles cure slowly. This is not usually objectionable and makes high quality of straw for feed. Someone has aptly said "Sweet clover makes pasture out of stubble and hay out of straw."

Use Nurse Crop for Spring Seeding.—When sowing sweet clover in the spring, some nurse crop should always be used, as sweet clover does not compete strongly with weeds and when sown alone in the spring it is likely to be killed out by weeds. Any of the small grains may be used as nurse crops, and all have given satisfactory results. Perhaps the safest nurse crop for Ohio conditions is an early variety of oats, such as Fulghum or Sixty Day. Barley is equally good where it is grown. Wheat is the most common nurse crop in Ohio, but in nearly every case where wheat and early oats have been compared a better stand has been secured in the oats. Even late oats have been superior to wheat in some cases, tho markedly inferior to early oats or barley.

Summer Seedings.—Summer seedings may be made alone, in corn, or perhaps in soybeans. For seeding alone the seedbed should be firm and moist. It is rarely safe to seed later than August 15. Seeding sweet clover in corn at the last cultivation has about an even chance of success. In a dry season it will not amount to much, but in a wet season remarkable growths are sometimes made (Fig. 11). Soybeans are an even less favorable companion crop, but some partial stands have been secured by seeding sweet clover in them. Don't give up a sweet clover stand too soon. Often what seems like a hopelessly poor stand will make an amazing growth the second season.

Mixtures Containing Sweet Clover.—Often, a mixture will be better than sweet clover alone. On land which is not uniformly alkaline, 4 or 5 pounds of alsike per acre is a most useful addition, and a little timothy is usually added also. These will occupy the spots where the sweet clover fails and are far preferable to the weeds which would otherwise fill these spots. Where it is intended to make hay the second year, alfalfa may be valuable. The first

FIG. 11. A FRANKLIN COUNTY CORNFIELD. OCTOBER 1.
A 12" ear of corn on end in the foreground gives an idea of the height.

cutting will be very heavy mixed sweet clover and alfalfa. The sweet clover will be killed and the next two cuttings will be pure alfalfa. In general, however, alfalfa alone is preferable to any sweet clover mixture for hay.

A popular mixture in some sections is 4 pounds each of alfalfa, alsike, timothy, and sweet clover. For seeding permanent pastures sweet clover may be sown with bluegrass, timothy, or brome grass,

and as the clover dies out it is followed by a surprising growth of the grasses. Four pounds of bluegrass, 6 pounds of timothy, and 8 pounds of sweet clover would be a suitable seeding for most Ohio soils. For rotation pastures, timothy is a valuable addition to extend the period of pasturing in the fall and occupy possible acid spots.

The Seed Crop

A Prolific Seed Producer.—An important advantage of sweet clover is that it produces seed liberally whenever it is grown. The yields of seed range much higher than alfalfa and other clovers if the crop is handled to avoid shattering. The average is from 4 to 6 bushels per acre, and from 10 to 12 or more bushels are not uncommon. For this reason the seed can never be permanently high-priced, and usually it will be, as now, the lowest-priced clover seed on the market. The cost of seeding this crop is lower than for any other legume.

Pasture or Clip the Intended Seed Crop.—Seed is produced in the second year's growth and is usually ready to harvest late in August. The plants are usually from 5 to 8 feet high and hard to harvest. Some secure a less vigorous growth of the seed crop by clipping the early growth, cutting a hay crop or pasturing. Clipping must be done high, early and carefully. Even then it will sometimes injure or kill the stand. Because of this danger, most seed growers simply let the season's growth mature. A grain binder stripped merely to clip the tops and let them fall has been successfully used to clip the seed crop in some sections. Perhaps the safest method of securing a finer stemmed seed crop is to pasture until June 1.

Cut When Two-thirds of the Pods are Brown.—The seed does not ripen all at once. Indeed there are usually ripe seeds and flowers on the same plant. Since the seeds shatter off as they ripen, it is never possible to secure the entire yield. The best time to cut is a matter of nice judgment as to the time one can secure the most ripe seed. The novice is more likely to let it go too long and lose his best seed by shattering than to cut too soon. As near a rule as can be given is to cut when two-thirds of the pods are brown.

Cut With the Grain Binder.—There are two main difficulties in harvesting sweet clover. They are the coarseness of the crop, making it hard to handle, and the ease with which the ripe seed shatters. Probably the best method of harvesting is with the grain

binder, cutting on a damp day or early in the morning before the dew is off, in order to avoid shattering. For large acreages it may be necessary to cut at night. This is unusual, but is worth while because the damp plants pack and go thru the machine better than in the daytime, and there is almost no shattering. If cut with a binder in daytime it is practically necessary to have sheet iron pans under the binding head and under the end of the platform to catch the shattered seed. *

Other methods of cutting are with a mower, which shatters most of the seed; with a corn binder, which takes too narrow a swath; and with a self-rake reaper, which is fairly satisfactory

FIG. 12. SWEET CLOVER FOR SEED.

but which few people have. None of these methods are as good as the grain binder for Ohio conditions.

The bundles may be shocked in narrow shocks without capping, but usually it is preferable to lay the bundles on the stubble, merely arranging them for easy pitching when they are hauled in (Fig. 13). This causes less shattering of seed from handling and by insects.

Threshing Sweet Clover.—Sweet clover is best threshed from the field, as it loses seed easily every time it is handled. If the wagons do not have perfectly tight bottoms they should be covered with canvas to catch shattered seed. The grain separator is the

* See Farmers' Bulletin No. 836, which can be secured from the United States Department of Agriculture, Washington, D. C.

most satisfactory machine on which to thresh sweet clover. The clover huller may be used, but the straw is so coarse that the huller does not handle it well. However, the separator will not hull the seed, and the seed in the hull must either be put thru a clover huller, or, what is preferable, if one is available, a combination huller and scarifier. This latter machine will hull the seed and can then be used to scarify it for market. Some separators with hulling attachments are on the market which give satisfactory results in threshing sweet clover.

The straw is not very valuable for feed, but is perhaps equal to corn stover. It makes excellent bedding and manure.

Special Uses of Sweet Clover

Sweet Clover Silage.—The difficulty of utilizing the first crop of sweet clover the second year has led to many experiments in using it for silage. As yet this method of utilization is practically unknown on Ohio farms. According to the report of those who have tried it, sweet clover makes better silage than any other legume, as it does not usually become slimy and ill-smelling as do most legume silages.

Sweet clover for silage is harvested with the grain binder and then cut up as is corn. It usually is harvested just after coming into bloom, or earlier, if a second crop is desired. One precaution is necessary. The bundles must be allowed to wilt for a while in the sun before being put in the silo. Sweet clover as cut may contain from 80 to 85 percent of water, while to keep best, the silage should contain only from 60 to 70 percent of water. Unwilted sweet clover put in the silo will drain out considerable juice and the silage will be sour and ill-smelling. The yields will average about 10 tons of silage per acre.

Sweet Clover for Bees.—The oldest use for sweet clover in the United States is as a honey crop. Beekeepers sowed the seed in waste places for years before farmers thought of using it otherwise. Sweet clover will produce more honey than any other crop, and the quality is of the highest. The presence of bees in turn is favorable to large yields of seed. By using four fields, one of yellow sweet clover, one of white, and two of Hubam, one of which is clipped in August, sweet clover flowers for bee pasture could be provided from early June until after frost.

Sweet Clover as a Weed Eradicator.—The dense growth of sweet clover the second year makes it almost impossible for broad-leaved weeds to develop in it. One of the best methods of fighting Canada thistle, bindweed, and similar weeds is to allow sweet clover to grow undisturbed the second year.